Department of Energy
Richland Operations Office
P.O. Box 550
Richland, Washington 99352

JAN 0 8 2007

07-SED-0073

Mr. John J. Martell, Supervisor
Radioactive Air Emissions Section
Washington State Department of Health
Office of Radiation Protection
Post Office Box 47827
Olympia, Washington 98504-7829

Dr. O. S. Wang
Nuclear Waste Program
State of Washington
Department of Ecology
3100 Port of Benton Blvd.
Richland, Washington 99354

Addressees:

TRANSMITTAL OF RADIOACTIVE AIR EMISSIONS NOTICE OF CONSTRUCTION (NOC) FOR HEAD SPACE GAS SAMPLING ANALYSES AT THE WASTE RECEIVING AND PROCESSING FACILITY

This letter transmits the short form Radioactive Air Emissions NOC for Head Space Gas Sampling Analyses at the Waste Receiving and Processing Facility adjacent to 2404WC. This NOC is required by Washington Administrative Code 246-247. This letter also transmits the Minor Permit Modification Request and the Notification of Permit Modification Request. Enclosure 1 is being provided to the State of Washington, Department of Ecology (Ecology), consistent with their role as lead for the Hanford Site Air Operating Permit. Enclosures 2 and 3 are being provided to Ecology to transmit to the Tribes.

If you have any questions, please contact me, or your staff may contact Doug S. Shoop, Assistant Manager for Safety and Engineering, on (509) 376-0108.

Sincerely,

Keith A. Klein
Manager

SED:MFJ

Enclosures

cc: See page 2

cc w/encls:
J. A. Bates, FHI
H. E. Bilson, FHI
G. Bohnee, NPT
H. C. Boynton, FHI
B. J. Dixon, FHI
R. H. Engelmann, FHI
S. Harris, CTUIR
D. W. Hendrickson, Ecology
N. A. Homan, FHI
J. E. Hyatt, FHI
R. Jim, YN
K. A. Peterson, FHI
J. W. Schmidt, WDOH, MSIN B1-42
F. M. Simmons, FHI
D. Zhen, EPA
Environmental Portal, LMSI, A3-95, LMSI
Administrative Record (files: Waste Receiving and Processing Facility)

ENCLOSURE 1

Radioactive Air Emissions Notice of Construction (NOC) for
Head Space Gas Sampling Analyses at the Waste Receiving and Processing (WRAP) Facility

RADIOACTIVE AIR EMISSIONS NOTICE OF CONSTRUCTION FOR HEAD SPACE GAS SAMPLING ANALYSES AT THE WRAP FACILITY

This document serves as a notice of construction (NOC) application, pursuant to the requirements of Washington Administrative Code (WAC) 246-247. "Radiation Protection - Air Emissions," and Title 40 Code of Federal Regulations (CFR), Part 61, "National Emission Standards for Hazardous Air Pollutants," for conducting Head Space Gas Sampling (HSGS) Analyses in MO-444 as part of the Waste Receiving and Processing (WRAP) Facility. WRAP is operated by Fluor Hanford for the U.S. Department of Energy (DOE).

1.0 FACILITY LOCATION

Name and address of the facility, and location (latitude and longitude) of the emission unit:

The address and geodetic coordinates for the HSGS Analyses represented by the Hanford Meteorological Station are as follows:

U.S. Department of Energy, Richland Operations Office (DOE-RL)
Hanford Site
Richland, WA 99352

46° 33' 31.9" North Latitude
119° 38' 21.4" West Longitude

The HSGS Analyses is located in the 200 West Area on the Hanford Site, south of 23rd Street and west of Dayton Avenue. Figure 1 illustrates the location of the Hanford Site and Figure 2 illustrates the location of the HSGS Analyses facility. The HSGS Analyses facility is located inside the controlled-area fence of the 200 Areas.

2.0 RESPONSIBLE MANAGER

Name, title, address and phone number of the responsible manager:

Mr. Matthew S. McCormick, Assistant Manager for Central Plateau
U.S. Department of Energy, Richland Operations Office
P.O. Box 550
Richland, Washington 99352
(509) 373-9971.

3.0 TYPE OF PROPOSED ACTION

Identify the type and proposed action for which this application is submitted.

To establish a HSGS Analyses facility in MO-444. The proposed action for which this application is submitted is considered a new construction.

4.0 STATE ENVIRONMENTAL POLICY ACT

If the project is subject to the requirements of the State Environmental Policy Act (SEPA) of 1971 contained in chapter 197-11 WAC, provide the name of the lead agency, lead agency contact person, and their phone number.

Under WAC 197-11-845, the proposed action and proposed activities categorically are exempt from the requirements of SEPA.

5.0 PROCESS DESCRIPTION

Describe the chemical and physical processes upstream of the emission unit(s).

Background

Analyses of head space gas sample/s are to be performed on samples obtained from transuranic (TRU) solid waste storage containers in various field locations. HSGS is performed per *Radioactive Air Emissions Notice of Construction Application for the TRU Retrieval Process* (DOE/RL-2001-57). The HSGS protocol employs a syringe sampling system to collect head space gas samples for analysis. To sample the container head space gas, a side-port needle is pressed through the sample port septum and into the head space beneath the lid. This permits the gas to be drawn under a vacuum directly into the syringe. Samples are withdrawn into a syringe through a 0.5 micron filter (99.95% efficient, Pall Corporation* or equivalent).

Process for Approval

The syringe is transported to a field laboratory where the sample is inserted into the gas chromatograph mass spectrometer (GCMS) equipment (Figure 3). The emissions will be vented from the GCMS and exhausted to the atmosphere through a room exhaust fan (approx. 193 ft^3 per minute [5.5E06 ml per minute] capacity) as shown in Figure 3. The process involves injecting the sample from the syringe into the GCMS for analysis. The analysis involves heating the gas to greater than 200° Centigrade (C) and then emitting the analyzed gas at a rate of approximately 30 ml per minute. Up to 150 of these samples are planned to be done per week. Emission calculations indicate that this process will result in a maximum potential to emit (PTE) of approximately 8.0E-10 millirem per year to the onsite receptor. The calculations are shown in Table 1.

6.0 PROPOSED CONTROLS

Describe the existing and proposed abatement technology. Describe the basis for the use of the proposed system. Include expected efficiency of each control device, and the annual average volumetric flow rate in cubic meters/second for the emission unit.

Emission controls for HSGS are not applicable because the sample is heated to greater than 100°C and is assumed to be emitted as a gas.

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* Pall Corporation, East Hills, NY 11548, http://www.pall.com.

7.0 DRAWINGS OF CONTROLS

Provide conceptual drawings showing all applicable control technology components from the point of entry of radionuclides into the vapor space to release to the environment.

Drawings of controls are not applicable. A flow schematic is provided for clarification.

8.0 RADIONUCLIDES OF CONCERN

Identify each radionuclide that could contribute greater than ten percent of the potential-to-emit TEDE to the MEI, or greater than 0.1 mrem/yr potential-to-emit TEDE to the MEI.

The radionuclides of concern exist as particulates and/or gases. All radionuclides are assumed to be either americium-241 (alpha) or strontium-90 (beta-gamma) for purposes of estimating PTE and for monitoring and reporting of emissions. This is based on *Radioactive Air Emissions Notice of Construction Application for the Waste Receiving and Processing Facility* (DOE/RL-2000-34).

Other radionuclides that could be encountered are strontium-90, cesium-134, cesium-137, europium-152, europium-154, plutonium-238, plutonium-239, plutonium-240, plutonium-241, americium-241, americium-243, curium-244, and californium-252. In addition, essentially any radionuclide isotope could be encountered. All alpha emitters are conservatively represented as Am-241 and the beta/gamma emitters are represented as Sr-90.

9.0 MONITORING

Describe the effluent monitoring system for the proposed control system. Describe each piece of monitoring equipment and its monitoring capability, including detection limits, for each radionuclide that could contribute greater than ten percent of the potential to emit TEDE to the MEI, or greater than 0.1 mrem/yr potential to emit TEDE to the MEI, or greater than twenty-five percent of the TEDE to the MEI, after controls. Describe the method for monitoring or calculating those radionuclide emissions. Describe the method with sufficient detail to demonstrate compliance with the applicable requirements.

The potential unabated offsite dose associated with this activity for normal operations is calculated to be less than 0.1 millirem per year. The method of calculating annual emissions to satisfy all emissions monitoring and reporting requirements is as shown in Table 1.

10.0 ANNUAL POSSESSION QUANTITY

Indicate the annual possession quantity for each radionuclide.

The annual possession quantity from this emission point is 4.7E-11 curies alpha per year as represented by Am-241 and 7.0E-10 curies beta per year as represented by Sr-90 as shown in Table 1. An assumed 10% void space in the container is used to calculate the concentration in Ci/ml for the HSGS as shown in Table 1.

11.0 PHYSICAL FORM

Indicate the physical form of each radionuclide in inventory: Solid, particulate solids, liquid, or gas.

All the radionuclides listed in Section 8.0 are present as particulate solids at ambient conditions; however, there may be negligible amounts of gas emitted. Because the stream is heated above 100°C, a release fraction of 1.0 is used to estimate emissions.

12.0 RELEASE FORM

Indicate the release form of each radionuclide in inventory: Particulate solids, vapor, or gas. Give the chemical form and ICRP 30 solubility class, if known.

All the radionuclides listed in Section 8.0 would exist below their boiling point upon being emitted, so would be emitted as particulates. Some negligible amounts of gaseous radionuclides might also be emitted.

13.0 RELEASE RATES

Give the predicted release rates without any emissions control equipment (potential to emit) and with the proposed control equipment using the efficiencies described in subsection (6) of this section. Provide the latest year's emissions data or emissions estimates. Indicate whether the emission unit is operating in a batch or continuous mode.

The predicted unabated (without any emissions control equipment) release rates and abated release rates for each radionuclide in Section 8.0 are 8.0E-10 millirem per year.

The emissions resulting from the activities covered by this NOC, in conjunction with other operations on the Hanford Site, will not result in exceeding the National Emission Standard of 10 millirem per year (40 CFR 62, Subpart H)

The emission unit will operate in batch mode.

14.0 LOCATION OF MAXIMALLY EXPOSED INDIVIDUAL

Identify the MEI by distance and direction from the emission unit.

The maximally exposed individual (MEI) from WRAP is located at the Laser Interferometer Gravitational Wave Observatory (LIGO), approximately 18.3 kilometers east southeast of the Reduction Oxidation Facility (S Plant), conservatively chosen to represent 200 West Area. Dose estimates for unit curie releases of selected radionuclides were calculated for emissions from the 200 West Area. These dose estimates were calculated for an onsite member of the public working at LIGO, who works within the Hanford Site boundary, and who eats food grown regionally.

15.0 TOTAL EFFECTIVE DOSE EQUIVALENT TO THE MAXIMALLY EXPOSED INDIVIDUAL

Calculate the TEDE to the MEI using an approved procedure. For each radionuclide identified in sub section (8) of this section, determine the TEDE to the MEI for existing and proposed emission controls, and without any existing controls using the release rates from subsection 13 of this section. Provide all input data used in the calculations.

The total unabated and abated PTE for all activities in this NOC is 8.0E-10 millirem per year TEDE to the MEI. Because no abatement is involved, the abated TEDE to the MEI would equal the same. These values are shown in Table 1 and are based on dose factors provided in *Calculating Potential-to-Emit Releases and Doses for FEMPs and NOCs* (HNF-3602).

16.0 COST FACTORS OF CONTROL TECHNOLOGY COMPONENTS

Provide cost factors for construction, operation and maintenance of the proposed control technology components and the system, if a BARCT or ALARACT demonstration is not submitted with the NOC.

Cost factor inclusion is not applicable.

17.0 DURATION OR LIFETIME

Provide an estimate of the lifetime for the facility process with the emission rates provided in this application.

Activities covered by this NOC will take place through 2027.

18.0 STANDARDS

Indicate which of the following control technology standards have been considered and will be complied with in the design and operation of the emission unit described in this application:

The technology standards listed in WAC 246-247-110(18) are not applicable to GCMS emission units. The ASME/ANSI codes provided are applicable to forced ventilation systems with HEPA filtration. The remaining codes are applicable to ventilation systems that contain emissions sampling systems, which this facility does not utilize.

19.0 REFERENCES

AIR 99-1006, letter from Allen W. Conklin, WDOH, to J.E. Rasmussen, DOE-RL, dated October 18, 1999, Washington State Department of Health, Olympia, Washington.

DOE-ORP, 2003, letter from R.J. Schepens, DOE-ORP, to Jeff KenKnight, EPA, and A.W. Conklin, WDOH, "Radioactive Air Emissions Notice of Construction (NOC) Application for Categorical Tank Farm Facility Waste Retrieval and Closure: Waste Retrieval Operations", 03-ED-172, dated 12/10/2003, U.S. Department of Energy, Office of River Protection, Richland, Washington.

DOE/RL-2000-34, *Radioactive Air Emissions Notice of Construction Application for the Waste Receiving and Processing Facility*, Rev. 1, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

DOE/RL-2001-57, *Radioactive Air Emissions Notice of Construction Application for the TRU Retrieval Process*, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

HNF-3602, *Calculating Potential-To-Emit Releases and Doses for FEMPs and NOCs,* latest revision, Fluor Hanford, Richland, Washington.

WDOH, 2006, *The Department of Energy Hanford Site Radioactive Air Emissions License #FF-01,* "Emission Unit ID 50", Washington State Department of Health, Olympia, Washington.

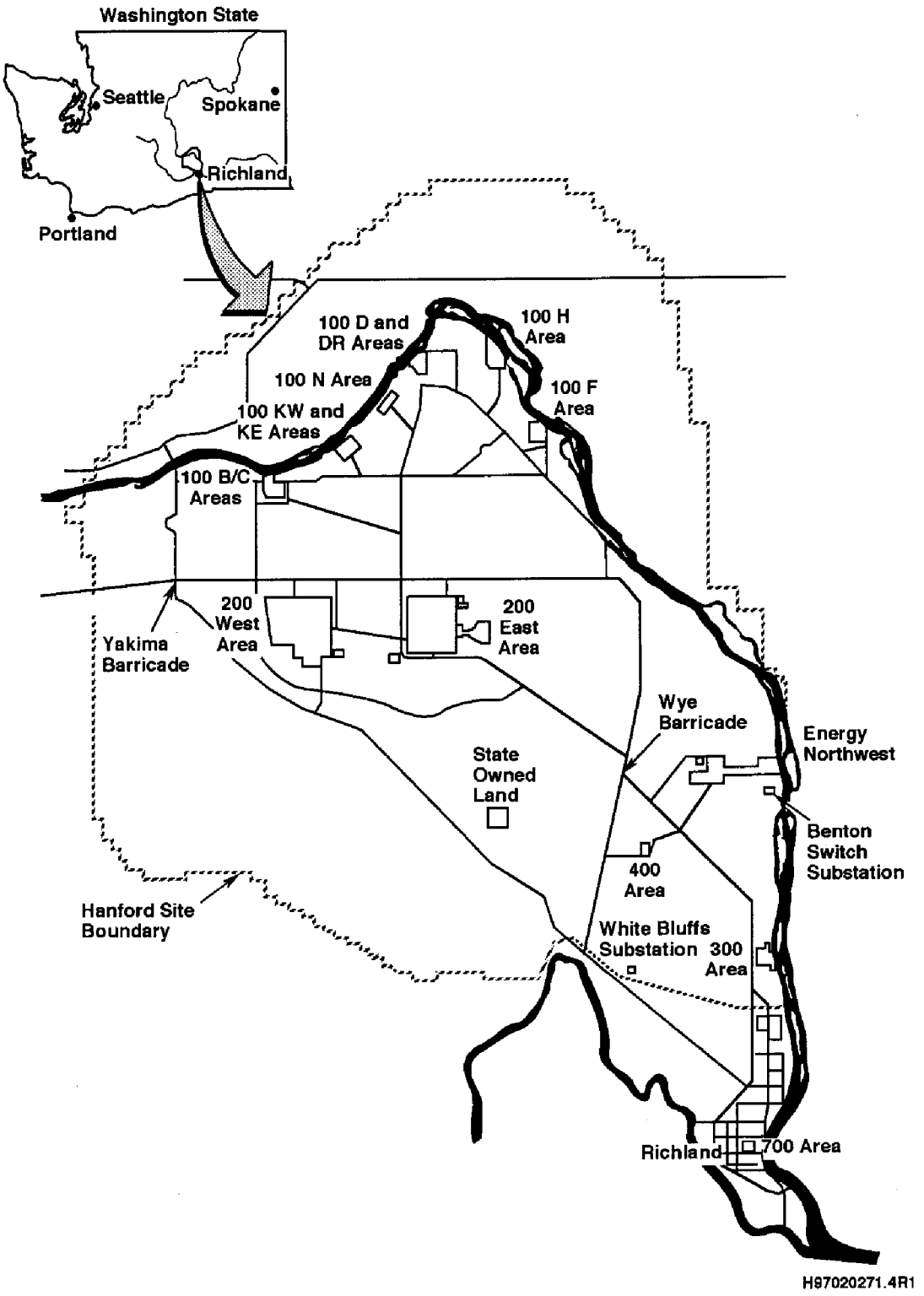

Figure 1. Hanford Site.

Email AND Fax completed form to Joy Redman (360) 236-2255
Once Approved Email AND Fax form to AOP Team (509) 373-0743

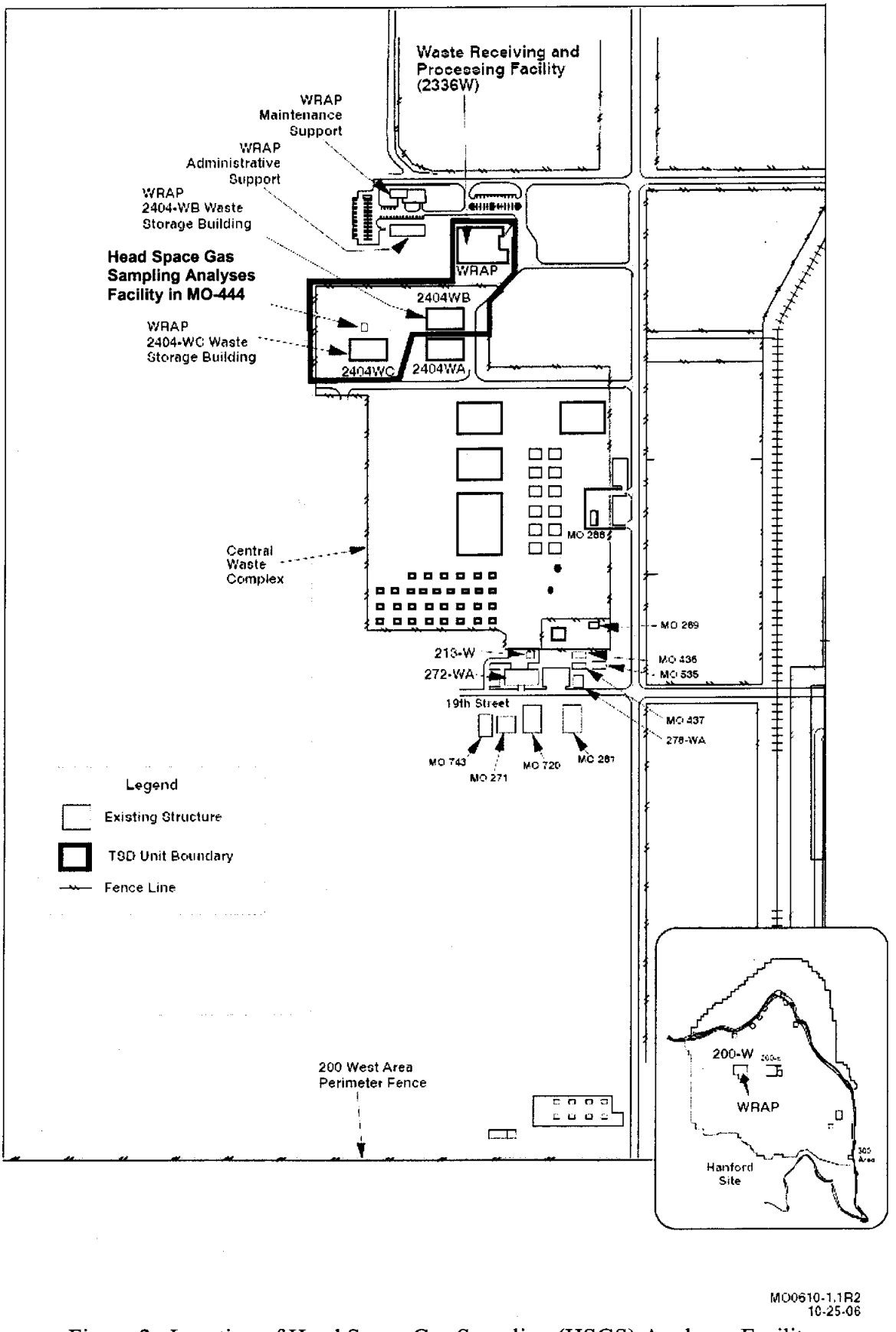

Figure 2. Location of Head Space Gas Sampling (HSGS) Analyses Facility.

Email AND Fax completed form to Joy Redman (360) 236-2255
Once Approved Email AND Fax form to AOP Team (509) 373-0743

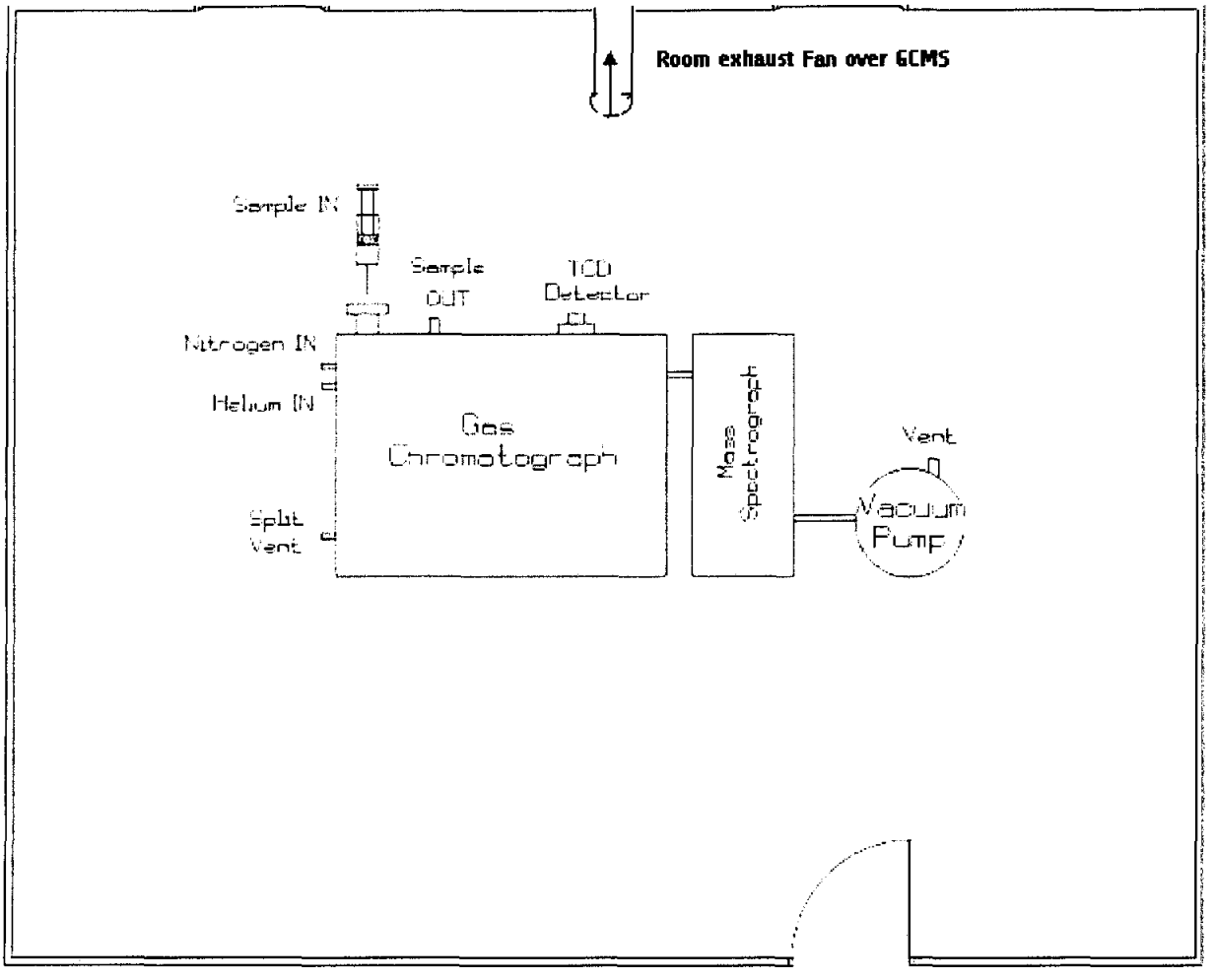

Figure 3. HSGS Analyses Facility in MO-444.

Email AND Fax completed form to Joy Redman (360) 236-2255
Once Approved Email AND Fax form to AOP Team (509) 373-0743

Table 1. Unabated Dose Calculations for HSGS with Gastight Syringe.

Assumed Isotope	Ci/Drum[a]	Drum Headspace concentration (Ci/ml)[b]	Sample Volume (ml)	HSGS filter efficiency (≤0.5 micron filter)	Sample/ year	Ci analyzed/ year[c]	Release Factor[d]	APQ, Unabated Release Rate (Ci/year)	Onsite unit dose factor (mrem/Ci)[e]	Unabated dose (mrem/year)
Am-241	1.25	1.2E-13	100	0.0005	7800	4.6E-11	1	4.68E-11	1.70E+01	7.96E-10
Sr-90	18.75	1.8E-12	100	0.0005	7800	7.02E-10	1	7.02E-10	1.10E-02	7.73E-12
Total	20							7.49E-10		8.04E-10

[a] DOE/RL-2000-34, *Radioactive Air Emissions Notice of Construction Application for Waste Receiving and Processing Facility.*
[b] Assume 10% void space; curies, bounded by Am-241 and Sr-90.
Release fraction of 2.0E-09 for vented containers (AIR 99-1006). Ci/ml = Ci/drum * 2.0E-09/ (55 gal * .1 * 3785.4 ml/gal).
[c] Ci/yr = drum headspace concentration * sample volume * HSGS filter efficiency * sample/year.
[d] Because analytical process is >100°C, release factor of 1 is used.
[e] Dose factor from *Calculating Potential-to-Emit Releases and Doses for FEMPs and NOCs* (HNF-3602).

APQ = annual possession quantity
Ci = curie
gal = gallon
HSGS = head space gas sampling
ml = milliliter
mrem = millirem

Email AND Fax completed form to Joy Redman (360) 236-2255
Once Approved Email AND Fax form to AOP Team (509) 373-0743

ENCLOSURE 2

Minor Permit Modification Request

MINOR PERMIT MODIFICATION REQUEST

Permit Number 00-05-006

Attach the completed Notification of Permit Modification Request Form to the EPA/tribes/affected state

Minor permit modifications are allowed under WAC 173-401-725 and meet the following criteria:
- Does not violate any applicable requirement
- Does not involve significant changes to existing monitoring, reporting, or recordkeeping requirements in the permit
- Is not a Title I modification.

Provide the following information pursuant to WAC-173-401-725(2)(b)

Description of the change:

Establishment of a Head Space Gas Sample Analyses facility in MO-444 at WRAP. This action is considered as new construction.

Describe the emissions resulting from the change:

This analysis involves sampling potentially contaminated air from drums containing TRU wastes. The emissions will be vented from the analytical equipment and exhausted to the atmosphere through a room exhaust fan. Analysis involves heating the sample gas to greater than 200° C and then emitting the analyzed gas at a rate of approximately 30 mL per minute from the analytical equipment. Up to 150 samples are to be done per week. Emission calculations indicate that this will result in a maximum PTE of approximately 8.04E-10 mrem per year to the onsite receptor.

Describe the new applicable requirements that will apply as a result of the change:

Other controls such as limits on inventory and assumptions used in potential to emit calculations. Potential to emit will be based and monitored via calculations used in the NOC application.

Suggested Draft Permit Language:

for example:
- *Monitoring/PCM that will be used to support compliance determination/certification*
- *Description of air pollution control equipment (abatement technology)*
- *Other controls such as limits on inventory; process limits such as throughput, hours of operation, or acceptance criteria; or other assumptions used in potential to emit calculations*
- *Other process descriptions that constitute a term or condition, such as reporting or recordkeeping requirements.*

CERTIFICATION

Provide certification pursuant to (WAC 173-401-725(2)(b)(iii))

I certify that based on information and belief formed after reasonable inquiry of the person or persons who perform activities, or those persons directly responsible for gathering the information, the statements and information provided in this modification request are true, accurate, and complete. I also certify that the proposed modification meets the criteria for use of minor permit modification procedures, as hereby requested.

Responsible Official: [signature]

Title: KEITH KLEIN, M&A, RICHLAND OPERATIONS OFFICE

Signature: | Date: 1/5/07

For Hanford Site Use Only:

AOP Change Control Number: | Date Submitted:

ENCLOSURE 3

Notification of Permit Modification Request to the
U.S. Environmental Protection Agency, Region 10, The Tribes, and Affected States

NOTIFICATION OF PERMIT MODIFICATION REQUEST TO THE U.S. ENVIRONMENTAL PROTECTION AGENCY, REGION 10, THE TRIBES, AND AFFECTED STATES

This form serves as notification of a request for an Air Operating Permit Modification per WAC 173-401-725(2) and (3).

Air Operating Permit Number: 00-05-006	
Source: U.S. Department of Energy, Richland Operations, Hanford Site	
Mailing Address: P.O. Box 550 Richland, WA 99352	**Physical Address:** 825 Jadwin Ave. Richland, WA 99352
Brief Description: Head Space Gas Sample analysis involves sampling potentially contaminated air from drums containing TRU wastes. The emissions will be vented from the analytical equipment and exhausted to the atmosphere through a room exhaust fan. Analysis involves heating the sample gas to greater than 200° C and then emitting the analyzed gas at a rate of approximately 30 ml per minute from the analytical equipment. Up to 150 samples are to be done per week. Emission calculations indicate that this will result in a maximum PTE of approximately 8.04E-10 mrem per year to the onsite receptor.	
Contact Name: Mr. Matthew S. McCormick	**Phone:** (509) 373-9971
Title: Assistant Manager for Central Plateau U.S. Department of Energy, Richland Operations Office	
FOR ECOLOGY USE ONLY	
Application Number	**Date Received**
Ecology Contact	
Date of Publication in Permit Register	**Public Comment Period Ends**